

[illegible]

Abstract of Disclosure

A charge pump for reducing capacitance in a loop filter of a phase locked loop. The loop filter contains a resistor and a capacitor. The charge pump includes first and second input current sources for supplying first and second currents to the charge pump, a first output current source for receiving the first current from the charge pump, and a second output current source for receiving the second current from the charge pump. The charge pump also contains a plurality of up pulse switches and down pulse switches for controlling current flow through the charge pump such that only a fraction of the current that flows through the resistor of the loop filter flows into and out of the capacitor for charging and discharging the capacitor. The size of the capacitor can be reduced accordingly based on the amount of current used to charge and discharge the capacitor.